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Public Health Significance of Rare Mycobacterium Tuberculosis in Sputum: For the past 30 years at the Pottenger Sanatorium the dilution-flotation-picric-acid technic has been employed for the examination of sputum.

By examining 3-day specimens every six weeks, it has not been possible to demonstrate an absence of bacilli for three consecutive examinations in more than 4 or 5 percent of the patients at the time of discharge from the sanatorium.

When patients with "rare bacilli" are discharged they are physically well and able to walk from one to four or five miles a day. They rarely cough. It is often only with the greatest persistence that specimens of sputum are obtained.

In order to determine the epidemiological significance of "rare bacilli," a comparison might be made between the stage when these patients are expectorating bacilli rarely and when they are expectorating them freely. The Phipps Institute reports on 158 24-hour specimens from 37 patients. The average 24-hour output of bacilli for white patients was 129,593,000; for Negro patients 894,000,000. The highest count was 20,499,918,000. J. E. Pottenger studied a patient's output of bacilli for several days. The counts were 128, 130, 133, 83, 98, and 131 million. Another patient's count was 30 billion.

The table below shows the results of counts of bacilli in the sputum made at 6-week intervals in patients in the sanatorium. The first six have attained

Daily output of tubercle bacilli in sputum of patients with pulmonary tuberculosis

	PATIENTS	
1	E. T. G.	3,900,000,000—1,500,000—3,000,000—50,000,000—21,000—500,000—9,300—9,340,000—1,200,000—3,266—0—0—875—892—0—0—0.
2	S. A.	825—0—0—0—586—0—0—0—14,700—0.
3	S. D.	1,700,000—10,600,000—4,200,000—9,250—16,800—12,000,000—40,385—64,100—38,500—3,260—112,700.
4	P. O.	11 days, 0—1,458—13,416—0—13,880—0.
5	J. S.	2,800,000—5,100,000—2,000,000—46,000,000—2,340—5,540—1,106—0—0.
6	A. H.	0—3,266—0—0—0—0—4,375—0—0—0—0.
7	L. G.	80,000,000—5,000,000—47,000—171,000,000—137,000,000—95,000,000.
8	G. H.	190,000,000—267,000,000—64,000,000—385,000,000—240,000,000—7,800,000,000.

the "rare bacillus" stage; the last two are wholly in the acute stage. The figures indicate the number of bacilli expectorated in 24 hours. The first six patients were steadily improving, but it will be noted that the decline in numbers of bacilli was not steady. Patients E.T.G., S.D., and J.S. all had cavities which

were healing spontaneously. Patients S.A., P.O., and A.H., in whom M. tuberculosis had not previously been found, had minimal cases.

J. E. Pottenger made careful comparison of the dilution-flotation-picric-acid and the Ziehl-Neelsen technics for the examination for M. tuberculosis and found the former 277 times more sensitive in purulent sputum, and 172 times more sensitive in "muco-epithelial" sputum. This sensitive technic may reveal M. tuberculosis when the patient expectorates only a few hundred or a thousand bacilli a day.

Just how dangerous sputum containing a few hundred or a few thousand bacilli in a 24-hour quantity is, is not known. If the patient knows he has, or has had, tuberculosis, usually the sputum is destroyed. In fact, when the sputum decreases to a very small amount it is often swallowed unknown to the patient. If a few hundred or a few thousand bacilli should be expectorated into a room, however, they would be diluted by the air which, if the room is well ventilated, is constantly changing, so that the danger would be minimal. Under ordinary conditions of light and ventilation in the average house, most bacilli would be killed in a few hours. It must be admitted, however, that there might be danger in overcrowded, poorly ventilated houses, particularly those occupied by undernourished persons.

According to the studies at the Pottenger Sanatorium, it is doubtful whether patients with chronic destructive lesions ever become wholly and continuously free from the discharge of M. tuberculosis; yet they may be able to carry on their work unhampered. Many ex-patients have been followed from 5 to 40 years, and it has been found that now and then, particularly following acute respiratory infections, they will cast off a few bacilli as a result of the stimulation of their old foci. These patients usually become noninfectious soon after recovery from the acute respiratory infection. It is not the controlled patient, but the one who is not cognizant of his disease or the careless one, who is most dangerous to himself and to others.

The experience at the Pottenger Sanatorium is similar to that of Papworth Village in England, and indicates that it takes more than the expectoration of bacilli to cause infection. The report of 25 years' experience shows that, of 108 children born in Papworth Village, not one has developed active tuberculosis, nor has radiologic examination revealed an incidence of pulmonary abnormalities any higher than that found in the general population. Nevertheless, 90 of Papworth's 120 patients suffered from "open" tuberculosis. Of 260 children born before admission to the Village (in the usual city workman's environment), 5.1 percent had some type of active tuberculosis. These had lived outside the Village in the environment of "open" tuberculosis. Of these children, 8 were over 10 years of age on entering the Village. It is significant that no new cases of active disease developed among them after entering the Village.

This shows the protective value of patients living in a controlled environment, for it must be remembered that all of these children presumably had hereditary susceptibility and many were living in an environment of "open" tuberculosis. From this it might be interpreted that "rare bacilli" in controlled patients living in a controlled environment are of little danger.

The number of bacilli that will cause infection varies according to their virulence and the susceptibility and environment of the host. It is likely that many attempts at invasion are made before infection occurs, especially in hosts of low susceptibility. The important fact is that under conditions which exist infections do occur. But more important is the fact that there are fewer instances of disease than of infection. This might indicate that the patient protects himself through primary infection.

The infectiousness of bacilli depends largely on the environment in which they are discharged. They do not multiply outside the body, and many are nonvirulent and many are nonviable when discharged. Even virulent bacilli are quickly destroyed by direct sunshine and within a few hours by indirect sunlight. They live much longer in dark places when protected from drying. Their infectivity is favored by the dead air of nonventilated rooms and is very much reduced by moving currents of air.

In spite of the danger of infection in massively contaminated environments, those living therein do not all die of tuberculosis. Most of them are infected but do not develop clinical disease. This is a most significant fact in the program of prevention. It should be stressed, for it is the basis of protective vaccination. Throughout the ages not only were precautions rarely taken, but conditions of the premises were most favorable for the bacilli. Nevertheless, only about one new case developed regularly to each death and, wherever the social and economic status of the people improved, the number of deaths decreased.

Children are most susceptible and are prone to receive a primary tuberculous infection whenever exposure is prolonged. This carries with it an immunity, however, which provides increased protection. But the danger of metastases from primary infection lies in the fact that M. tuberculosis may remain viable and virulent for years in many of these foci and in metastases which form from them. At any time that the architecture of the encapsulating wall is disturbed either mechanically or chemically, endogenous reinfection may be produced.

The greatest danger of developing tuberculosis is always found among the poor because of deficient nutrition and unhygienic homes. Among them, from five to seven times as many deaths from tuberculosis occur as among families that live on a higher economic and social level. This means that the poor patient with tuberculosis is a maximum danger to himself and his associates.

Moreover, his chances of healing are less, for both his environment and possibly his tissues are more favorable to the life of the bacillus.

Regardless of all public health factors with which people are protected, infection still occurs. Furthermore, it occurs whether or not it can be shown that the host has been exposed intimately to "open" tuberculosis. (Two-thirds of the patients at the Pottenger Sanatorium give no history of associating with tuberculous patients.) The only reasonable interpretation of this fact is that infection depends much upon the patient's susceptibility. Chance infection is undoubtedly caused by a few bacilli entering the tissues of a highly susceptible individual. To be sure, infection of a person who lives with a patient who expectorates hundreds of millions of bacilli a day may occur no matter what the susceptibility of the individual. Probably no one is so resistant that he is able under all circumstances to ward off infection. But, on the other hand, the possibility must not be overlooked that primary infection caused by many bacilli may establish a higher degree of immunity than the few bacilli of chance infection. This is indicated by the Lubeck disaster mentioned below.

Puffer's studies have shown that hereditary susceptibility, which probably is similar or the same as general susceptibility, makes the host especially prone to infection. In the families which she studied, the same percentage of children who had tuberculous parents and who had, or had not, been exposed to "open" tuberculosis had clinical disease by the time they attained the age of fifty. The difference between the two groups was that those who were exposed by intimate association became ill in their earlier years; those casually exposed became ill later. Regardless of the fact that a higher grade of immunity develops in those infected by many bacilli than in those infected by a few, massive infection doubtless causes larger foci. These larger lesions contain larger numbers of bacilli and become less completely encapsulated and, hence, are more susceptible to injury by the vicissitudes of environment, growth, habits and other infections. Consequently, the patient with such a lesion is more apt to break down with clinical tuberculosis, particularly in the earlier years.

During the period between 15 and 25 years of age, the number of cases of clinical tuberculosis rises rapidly. This is the period when acute exudative tuberculosis predominates, a type caused by relatively large numbers of bacilli in patients whose cells are highly sensitized. The massive numbers of bacilli which cause this type of disease could well be endogenous in origin, but could hardly come from without. In the experience of the author, these patients with acute exudative tuberculosis have rarely associated with "open" tuberculosis at the time of falling ill. Thus, it should be assumed that the source may be the unhealed primary complex, or some metastasis therefrom, the enveloping walls of which are subject to injury by both mechanical and chemical factors.

In this connection, it must be remembered that the lung doubles in size from the beginning to the end of puberty. This may be a mechanical factor in

reactivating old foci. Clearly, a partly or wholly calcified focus cannot expand and increase in size as the pulmonary and bronchial tissues do. The result might be a weakening or break in continuity of the encapsulating walls with the escape of bacilli. Moreover, in this period the tissues must also bear many insults, such as those from malnutrition, unwholesome habits of life, and so forth, just such as will further weaken an already weakened enveloping wall. This is a period of high incidence of clinical tuberculosis, much of it being of the acute exudative type. The chronic proliferative type, on the other hand, advances slowly, probably because fewer bacilli cause the metastases and gradually immunize and desensitize the patient so that fibrosis predominates over inflammatory processes. This is the predominant form of the disease in later life.

Thus, susceptibility seems to be a factor in infection, reinfection, the type of disease, and the outcome of the disease.

In the future, susceptibility, the protective value of the primary complex, and vaccination must be given more consideration in providing a program for protecting people from tuberculosis. Mass roentgenographic studies of the population must be continued, but because susceptibility, both that of a general and hereditary nature, is so important, the finding of those infected will still leave the problem unsolved. Susceptibility must be reduced and preventive vaccination must be generally used among those exposed.

When reinfecting bacilli attempt invasion, the host is able to destroy many more than in the case of first invasion. Moreover, if reinfection occurs, there is a tendency for it to localize and heal, as pointed out by Koch in 1890 - 1891. Manwaring has shown that, within an hour after tubercle bacilli are injected into the peritoneal cavity of an immune guinea pig, nine tenths of them have been destroyed. This result was quite the opposite from that in the experiment of J. E. Pottenger, in which he infected two thirds of a group of nonimmune experimental pigs by injecting three tubercle bacilli more or less into the peritoneal cavity.

It would seem that the danger to individuals who are protected by a previous infection, either primary or of the reinfection type, in associating with tuberculous patients is negligible, particularly if they are following out the accepted regimen used in treatment. The writer has never recognized an infection transmitted from a patient with active disease to one who was approaching arrestment, although free association of patients in the sanatorium has been observed for more than forty years.

It is possible that the great numbers of bacilli in massively infected environments, by destroying the most susceptible, have kept the tuberculosis mortality high throughout the ages, and by the same process produced a more resistant stock. On the other hand, wherever there has been an improved environment, susceptibility decreased, and morbidity and mortality declined.

It must have been decreased susceptibility that reduced the death rate from tuberculosis in England and Wales from 330 per 100,000 population in 1860 to 175 in 1900, for few preventive measures were applied to make the patient's environment safe. In the forty years since 1900, preventive measures have been instituted, but, because of war, the decline has been only a little greater than during the years from 1860 to 1900, reaching a death rate of 70 per 100,000 in 1936. In Massachusetts the death rate declined from 444 in 1860 to 254 in 1900, and then, with the institution of preventive measures, the decline, unaffected by war, has been much greater. A death rate of 36 was reached in 1939.

A more rational attitude should be taken toward primary infection; more consideration of its protective nature should be shown. Likewise, it should be appreciated that primary infection carries with it, unless it heals or remains quiescent, the danger of being the source of endogenous metastases, responsible for much, possibly most, clinical disease. Were it not for its being the source of acute illness, such as meningitis in small children, and endogenous reinfection later, it might be accepted as almost wholly protective. But since it is also a danger, it must, if possible, be avoided.

The use of BCG will stimulate immunity, probably not as efficiently as virulent human bacilli, but sufficiently to protect most children from infection. Moreover, it carries no danger of causing endogenous reinfection. Doubtless vaccination should be repeated the same as in case of smallpox. Vaccination should not take the place of other measures but should supplement them.

For those who have inordinate fear of infection or of protective vaccination, the author suggests the study of the Lubeck disaster, in which virulent human bacilli were accidentally substituted for BCG. Two hundred and fifty-two children, before they were 10 days old, were each given a total of 1,200,000,000 living bacilli orally in three doses of 400,000,000. According to general opinion, all should have died; but instead 175 were living and well four years after. All were infected, but 70 percent had developed sufficient resistance to prevent the spread of the disease.

The author suggests the reduction of susceptibility to tuberculosis both through vaccination and improvement in environment and considers that an effective program would consist of: (1) mass roentgenographic studies until every individual has received the benefits which it offers; (2) clearing the slums in which most tuberculosis is found; (3) teaching people how to live and what to eat, and furnishing food, at least to children, when the bread-winner is ill, so that resistance is kept high; and (4) vaccinating children, thus stimulating their immunity without producing a focus of living bacilli within the human tissues from which the disease may spread and produce endogenous reinfection.

The patient with "rare bacilli" cannot be removed from society, but he can be made safe by instruction, and those who associate with him safe by vaccination, hygienic living, and adequate diet. (Am. Rev. Tuberc., Sept. '48 - F. M. Pottenger)

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Disregarded Seedbed of Mycobacterium Tuberculosis: The steady decline in the mortality from tuberculosis has been interpreted as indicating that this disease would, in the near future, become one of minor significance. This implies that there is a definite ratio, such as was found in the Framingham study, between new cases of tuberculosis and deaths from the disease. Robins pointed out that prior to 1934 there had been no systematic effort made to determine the prevalence of tuberculosis in any large city in the United States and that in surveys made in New York City since 1934 the racial prevalence of the disease has been found to be completely in discordance with the results anticipated from the application of standards based on mortality statistics. His study indicates that the mortality rate and the annual incidence rate are independent of each other. Robins and Reid were able to determine the "source case" for only a small percentage of new cases.

The unknown source of infection makes the control of tuberculosis the difficult problem that it is. The present study was undertaken to determine the location and the extent of the unknown source of infection, the disregarded part of Greenwood's "seedbed" of Mycobacterium tuberculosis.

To determine the incidence of deaths from tuberculosis and of unhealed tuberculosis in persons who died from other diseases, the necropsy records of Bellevue Hospital on adult patients over 15 years of age were examined for a 10-year period, from 1935 through 1944.

It was found that among patients who had died from tuberculosis the clinical diagnosis was incorrect six times more often for persons over 50 than for persons under 30 years. Among patients who had died from other diseases, but who had harbored tuberculosis which was capable of spreading, there was clinical recognition of tuberculosis in only one fourth.

Whenever the problem of tuberculosis is discussed, it is usual to place great emphasis on the decline in the mortality rate. To argue that the continuity of tuberculosis revolves about the mortality rate is to ignore the essential nature of the pathogenesis of the disease. Today a majority of the persons ill with tuberculosis are restored to a state of clinical well-being, and by proper management they may survive for years to die eventually from some other disease. Throughout their life many continue to shed bacilli, and it is unwise to ignore these persons, for they constitute one part of the seedbed.

There are certain other facts which show that tuberculosis is none too well controlled. In the year 1945, 35 percent of the deaths from tuberculosis in New York City occurred out of hospitals and one third of the deaths took place within one month after the patients were admitted to a hospital. Twenty-nine percent of the patients with tuberculosis left the hospital against medical advice. Clinical relapse of the disease accounted for 23 percent of the admissions to the hospital. Of the newly discovered cases, 12.4 percent were first known through death registrations. One half of the patients with tuberculosis were discharged either improved or unimproved. These facts relate to the known part of the seedbed.

Unhealed tuberculosis is seldom found recorded in the records of necropsy on adults under 30 years of age if death was due to some other disease. This suggests that, if unaltered in its course, progressive tuberculosis is a highly lethal disease in young adults. The finding of unhealed tuberculosis in increasing numbers of persons dead from other diseases, in proportion to those dead from tuberculosis, indicates that a progressive tuberculosis acquired in later life tends to be less explosive in type. It is in this part of the population, i.e., persons over 50 years of age, that tuberculosis is less likely to be suspected. This constitutes the unknown part of the seedbed that the necropsy data indicates contains 1,000 persons with cavity formation per 100,000 of the population.

All that is needed to initiate a new case of progressive tuberculosis is for a few bacilli to lodge in a favorable place in a lung and in a favorable soil. A larger number of new cases might develop in an environment heavily polluted with bacilli, but it is also possible to have cases occur from a chance exposure to relatively few bacilli. When there are many unrecognized spreaders of bacilli, chance exposure could occur often and new cases could develop without a discernible source of contact. In a high proportion of new cases of tuberculosis in adults in New York City the disease is apparently contracted from unrecognized sources of infection. Careful bacteriologic studies have shown that a considerable number of patients with "arrested" tuberculosis and of persons with tuberculosis "of no clinical significance" discharge bacilli intermittently. It is the survivors (who discharge bacilli) more than the persons who die from the disease who increase the chance for continuity of tuberculosis. A good parasite, for its survival, establishes itself in a large number of hosts, but only a minority succumb to the invasion. In this respect M. tuberculosis has done well. Because that part of the population which is made up of those over 50 years of age is larger today than it was twenty years ago, the necropsy data suggest that the seedbed for M. tuberculosis has enlarged and that the chances for its survival are increased rather than diminished.

The seedbed must be controlled if the continuity of the disease is to be broken. This requires an intensified search for unknown spreaders of the infection, a more thorough follow-up of known cases of tuberculosis, even if considered "of no clinical significance," a more thorough hospitalization of persons with active tuberculous disease, intelligent action on socioeconomic problems

to prevent a return of those factors which favor the propagation of the causative bacilli, and an intensified search for a cure of the disease in a pathologic as well as in a clinical sense.

The seedbed must be eradicated if tuberculosis is to be eradicated. (Arch. Int. Med., April '48 - E. M. Medlar et al.)

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The Problem of Irregular Discharge in the Hospitalization of the Tuberculous: Between July 1946 and June 1947 nearly 6,000 patients who required hospitalization and treatment for tuberculosis "walked out" of Veterans Administration hospitals. By contrast, less than 5,000 tuberculous patients were discharged after completing hospital treatment. In other words (excluding transfers to other hospitals for continuation of hospital treatment), 54.4 percent of the discharges from VA hospitals of living tuberculous patients were "irregular" and only 45.6 percent were "regular." Patients irregularly discharged represent a menace to the community and to themselves: to the community because of the danger of spreading infection; to themselves because the consequence of their actions is almost inevitably physical deterioration and need for subsequent re-hospitalization, and is sometimes death.

Of patients receiving irregular discharges between July 1946 and June 1947 whose condition at time of discharge was reported, 49 percent were discharged "unimproved." Only 12 percent of the patients discharged after completing hospitalization were "unimproved." A study of patients irregularly discharged from VA hospitals during July 1947 revealed that 62 percent left with diagnoses of far or moderately advanced active tuberculosis. Within 5 months, 29 percent of those whose whereabouts and status were known were already back in hospitals. Of 170 with far advanced active tuberculosis, 23 had already died - 22 of them from tuberculosis.

Why do these irregular discharges of tuberculous patients occur? What causes men who are ill to turn their backs on hospital treatment which provides the means of enabling them to return to reasonably useful and normal living? What can Veterans Administration do, or refrain from doing, that will encourage its tuberculous patients to remain in hospitals until they have received the maximum benefits from the medical skill available to them? This study was initiated in an attempt to answer these questions.

Because of the consequences of irregular discharge and the large proportion of such discharges from VA hospitals, the problem for Veterans Administration is serious. But to what extent is it peculiar to VA? Is it a problem of the tuberculous veterans, or of the tuberculous? Do most tuberculous patients in non-VA hospitals remain in hospitals until treatment is completed? Are there influences to which tuberculous veterans are subject that do not equally affect

tuberculous non-veterans? Finally, are there in VA hospitals conditions that do not occur in non-VA hospitals?

In order to make the irregular discharge rate for VA hospitals more nearly comparable with rates for non-VA hospitals, transfers were excluded from the calculation entirely and were considered as neither regular nor irregular discharges. The same was true of deaths.

One of the earliest studies of this problem shows that 71 percent of discharges from the National Sanatorium of Tennessee in 1923 were irregular. Another demonstrates that at least 32 percent of 6,906 patients discharged from 75 public sanatoria in 16 states during 1933 left without consent. Of 4,190 patients discharged from Wisconsin sanatoria from June 1924 to June 1934, 61 percent left against advice. This group included 1,037 patients with far advanced tuberculosis on admission, of whom 83 percent left irregularly.

Such instances can be multiplied. Studies in public sanatoria in Pennsylvania, Ohio, Iowa, New Jersey, New York, and the District of Columbia all support similar conclusions. Though rates of irregular discharge vary, they are everywhere so high that they constitute a major problem.

Adequate data on irregular discharge of patients from private sanatoria are not available, but the rates are believed to be lower than for public institutions. Nonetheless, observations of numerous authorities indicate that this is a harassing problem in private sanatoria also. Far from being peculiar to the Veterans Administration, irregular discharge appears to be an almost universal phenomenon in the care of the tuberculous. VA hospitals may have greater or lesser rates than particular non-VA hospitals for given periods, but the high incidence of irregular discharge is not characteristic of tuberculous veterans only.

It should also be noted that in no other disease is irregular discharge a comparable problem. An exhaustive search of the literature fails to disclose a single study or discussion of the problem in connection with any other disease.

In order to study the reasons for irregular discharges, tuberculous veterans who received irregular discharge from VA hospitals during July 1947 were interviewed by VA social workers on the staff of the hospital or regional office nearest the veterans' homes. The interviews were held at least 3 months after the irregular discharge. Unlike earlier studies of the causes of irregular discharge, this study was made to determine the causes (1) as viewed by the veterans themselves several months after irregular discharge, when feeling is less likely to color reflective thought, and (2) as viewed by workers experienced in dealing with problems of personal relationships who would have no reason to regard the irregular discharges as a reflection upon their own professional competence.

The social workers' evaluations disclosed that a basic cause of the irregular discharge in 43 percent of the cases was the pressure of factors originating outside the hospital and related to the veteran's personal, social, and economic status as a member of a family and of the community. In the opinion of veterans this was a cause of the irregular discharge in 54 percent of the cases. The pressure of factors originating within the hospital and related to the lack of adaptation between the hospital environment and the veteran as a patient were found to be a cause, in the social workers' evaluations, in 42 percent of the cases, as against 79 percent in the veterans' judgment. According to the social workers' evaluation, the pressure of factors originating within the personality of the veteran,and related to a sense of inadequacy, insecurity, or lack of understanding, was a cause of the irregular discharge in 51 percent of the cases, whereas veterans recognized these factors as causes in only 19 percent of the cases.

Measures most frequently mentioned by social workers as those which might have been effective in preventing the irregular discharge were: (1) intensive case work with the veteran and his family during and prior to the period of hospitalization; (2) psychiatric treatment for the veteran or orientation of the staff to an awareness of the emotional and psychic concomitants of tuberculosis; (3) more personalized treatment by the medical staff; and (4) more considerate application of hospital rules and procedures governing hospitalization.

Some of the basic considerations for VA in planning to solve the problem of irregular discharge are: (1) redefinition of discharges "against medical advice," in recognition of the fact that judgments on social as well as medical matters are involved; (2) strengthening the patient-doctor relationship, which is the foundation in treatment of tuberculosis, and to which all else is supplementary; (3) utilization of medical social service at the time of diagnosis and during the period prior to hospitalization to strengthen the patient's ability to endure the trying experience of hospitalization; (4) patient orientation at the hospital to enable the veteran to make the transition from the outside world to the hospital environment under constructive auspices; (5) psychiatric service in hospitals for tuberculosis or psychiatric consultation for tuberculous patients; (6) increased utilization of physical medicine and vocational rehabilitation measures; (7) more effective utilization by the doctor of hospital social service for patients; (8) greater cooperation between the regional office and the hospital social service units in order to develop an inclusive approach to the veteran's problems; (9) development of a medically supervised "trial visit" program for tuberculous patients in an attempt to solve the vexatious problem of passes and leaves; (10) utilization of special services for tuberculous patients; and (11) recognition of the cooperative nature of hospital treatment for tuberculosis.

VA cannot by itself solve the problem of irregular discharge of tuberculous veterans since it is basically social and a problem for the community at large. Failure to seek a solution is costing the community more than the expense of preventing and eliminating irregular discharge.

Whoever can persuade the community of this fact will serve not only the tuberculous but every other citizen as well. (Pub. Health Reps., 5 Nov. '48 - W. B. Tollen)

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Treatment of Psychoses with Bilateral Ablation of a Focal Area of the Frontal Cortex: Since October, 1946, the authors have been treating psychotics by removing specific areas of frontal cortex bilaterally. The specific site chosen was determined on the basis of work with primates.

In May, 1947, in order to determine more definitely the function of different parts of the frontal cortex, a cooperative research project was undertaken by the Columbia-Greystone Associates at the New Jersey State Hospital, Greystone Park, New Jersey. Every aspect of investigation that seemed feasible was followed. Twenty-four chronic psychotic patients who had not responded to conventional therapy, including shock, were operated upon with bilateral extirpation of different areas and combinations of areas of frontal cortex. The Brodmann map was utilized in selecting sites for removal. As controls, 24 additional patients were included. They were anesthetized, and hence felt that they, too, had had a special treatment.

Seven and one-half months following operation, 11 of the 24 patients who had been operated upon were out of the institution, and 10 were functioning at pre-illness capacity. Two of the control patients had left the institution and were functioning adequately. In all of the patients who showed definite improvement as a result of operation, Brodmann's areas 9 and/or 10 had been included in the removal.

The second important finding in the Greystone Project was that a considerable number of patients who had had large surface areas of cortex removed (more than the sum of Brodmann's areas 9 and 10) developed the tactlessness, irresponsibility, and lack of remorse that so frequently follow the conventional lobotomy. These symptoms did not appear when only areas 9 and/or 10 were removed or when a combination of other areas which included a smaller surface area than 9 and 10 were removed.

In addition to the Greystone patients, 23 private patients have been operated upon since October, 1946. All patients in this group had only areas 9 and/or 10 removed. Eight have been followed for less than three months and will, therefore, be excluded from the discussion of results. Of the remaining 15, all but 2 had been institutionalized before operation for periods up to 28 years. Conventional treatments, including shock, had been tried in almost every one and had failed. The remaining 2 were patients with Parkinson's disease who had had severe reactive depressions and who had made suicidal attempts. Seven patients had schizophrenia; 2 had severe obsessive neuroses and were resistant to prolonged psychotherapy (1 had had many shock treatments); 1 had

manic-depressive psychosis; 1 had a psychopathic personality; and 1 had a chronic agitated depression, and had been institutionalized for 22 years without remission.

Of this group of 15 patients, 10 are now able to function at their pre-illness capacity; 3 are able to be out of the institution with supervision; and 2 remain institutionalized.

Since its inception, this operation has undergone some minor revisions. At first, an attempt was made to remove a particular cortical area, area 9, including the tail which tapers to area 6. Cyto-architecture was thought to be the determining factor. Perhaps fortunately, in the first 4 cases the area removed overlapped into area 10. Later, as the dissection became more skillful, more attention was paid to the removal of posterior 9. Three patients operated upon during this period improved for two or three months, then relapsed. Two have been reoperated upon and in both it was found that a small part of anterior 9 remained. Removal of anterior 9 and part of 10 was followed by marked improvement. The third case, 1 of the 2 still institutionalized, will be reoperated upon soon.

In the Greystone work, patients with removal of area 10 and only slight infringement on 9 made excellent improvement. The operation as now performed consists of removal of the posterior part of area 10 and the anterior part of area 9. Improvement in the patients appears to be related to the site removed rather than to differences in cyto-architecture.

There have been no deaths from this operation. No patient who had the 9-10 removal has had a convulsion. No patient in the private series has had persistent convulsions, but 2 patients in whom posterior area 9 was removed had an occasional seizure during the first four postoperative days.

No patient who had areas 9-10 removed has had persistent incontinence, although when the tail of area 9 was removed, a few had incontinence for from one to three days. The majority of the patients have had only the specific site at the junction of 9 and 10 removed and they have not had even temporary incontinence. In the Greystone series, postoperative seizures developed in a few patients. This occurred following removals implicating areas 6 and 11.

The Greystone Project patients who had areas not including 9 and/or 10 removed showed little observable change in behavior. The idea of specific localization for different personality patterns in the frontal lobes can be discarded. Changes associated with removal of areas 9-10 were consistently in the sphere of affective response. Emotion was not absent or even noticeably blunted. The patient still felt rage, fear, and joy, but these emotions did not affect him so profoundly. Emotions were readily and more appropriately discharged. Repression of unpleasant emotions with resultant tension and subsequent regression into overt psychotic behavior no longer occurred. There was

not an over-all dampening of emotional response but rather an alteration of the painful affect associated with memories.

When questioned concerning the effect of operation, patients, regardless of the type of psychopathology, gave similar answers: "The tensions don't pile up; I don't feel like I'm now carrying a tremendous load; I'm not full of fear like I used to be," and so forth.

The end results of operation in this group of patients is by no means stereotyped; the operation has had a similar effect on each, but a patient operated upon for schizophrenia differs postoperatively markedly from one operated upon for an agitated depression. The patients behave postoperatively much as they did before the psychosis began. For instance, in the schizophrenic the basic personality disintegration remains apparent even though the overt psychotic symptoms have disappeared.

From this survey it is possible to judge where topectomy should fit into the psychiatrist's therapeutic armamentarium. Its specific effect is to alter the affective response so that tensions do not accumulate, thereby making regressive reparative behavior unnecessary. A thorough psychiatric evaluation, keeping this point foremost, is the only method of selecting cases for operation. Haphazard recommendations will result in an increased percentage of failures and will include patients that could have been helped by more conservative measures.

The conventional diagnostic categories cannot be the only criteria in determining whether or not a patient is a suitable candidate for operation. Patients with agitated depression and with agitated involutional paranoia, because of the intense affective component of their illness and its appropriateness to ideation, have a favorable prognosis.

The patient with manic-depressive psychosis in the depressed state, suffering from inwardly directed emotion, responds well; but when the compensatory manic period intervenes spontaneously to interrupt his suffering, the operation is of no avail. Further study of the effect of operation in those in the manic state is necessary; the authors have operated upon only 1 such patient in the stage of intense elation, with an unsatisfactory result.

A most thorough preoperative psychiatric study is imperative in order to determine which schizophrenics will benefit by operation. Consideration of clinical subcategories is of little help. Only schizophrenics in whom there is affect appropriate to ideation have a reasonable chance for improvement. Clinicians are well aware that this is more apt to prevail in the earlier stages of the disease. For example, the paranoid reacting to persecutory delusions responds well, but once grandiosity intervenes and produces emotional equilibrium, operation is of no avail. Other more conservative types of therapy are sometimes sufficient to arrest the schizophrenic development, but the psychiatrist should always be alert for signs of the early stages of deterioration so that operation can be undertaken before it is too late.

It seems feasible to assume that this procedure might help the psychopath. There is considerable tension in these patients which often precipitates overt outbreaks of psychopathic behavior. Clinicians have noted that when tension-producing situations are avoided, the psychopath often adjusts fairly well for prolonged periods. Thus far the authors have operated on 1 person of this type with very gratifying results in a six-months' follow-up study.

The question of whether psychoneurotics should ever be operated upon deserves special consideration. The clinical studies and the psychologic tests undertaken by the authors thus far indicate that relatively little is sacrificed by the patient as a result of removal of a small specific area. It must be considered first and foremost, however, that brain tissue is being removed and that it can never be replaced. This procedure cannot, therefore, become a substitute for adequate and skillful psychotherapy.

Psychologic tests on the Greystone patients showed that in most cases over-all intellectual function improved. There was little or no loss in the ability for abstract thinking according to Goldstein's tests. The principal psychologic changes were shown by the tests that picked up the altered affective response (the Rorschach and Levy movement cards). (Psychosom. Med., Sept.-Oct. '48 - R. G. Heath and J. L. Pool)

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The Control of Circulatory Stasis by the Electrical Stimulation of Large Muscle Groups: Many patients fear or resent the attendant discomfort of early movement after operation prescribed as a preventive of venous thrombosis and pulmonary infarction. In others, unconsciousness, weakness or senility may exclude active movement. In all of these cases passive movement and massage might supply the answer, but would be impractical on a large scale in a big hospital. Any other procedure that ensures movement of venous blood without discomfort should therefore be a welcome addition to postoperative treatment, not only to prevent venous thrombosis, but to avoid peripheral circulatory failure.

The physiological considerations involved in such a procedure are briefly as follows. Circulation is maintained by three sets of pumps strategically placed along the blood circuit, namely, the heart, the voluntary muscles, and the diaphragm. One of the essentials for efficient cardiac activity is a mechanism for returning an adequate volume of venous blood to the heart. This is maintained by skeletal muscle contractions (muscle pump) and by the piston-like action of the diaphragm during respiration (respiratory pump). Increased muscular activity therefore automatically tends to increase cardiac inflow and output.

The various causes of circulatory failure include loss of blood volume, failure of cardiac, muscle, or respiratory pumps and the loss of vascular tonus.

It is only in recent years that some appreciation has been had for the role of the muscle pump, particularly in regard to stagnation of blood in the lower limbs and the relation of this condition to postoperative shock and thrombosis, with pulmonary embolism.

Some years ago it occurred to the authors that such stasis might be overcome by the artificial induction of muscle activity, for instance, by rhythmical electrical stimulation.

Because thrombi form most often in the legs, especially in the veins of the calf muscles, and because leg muscles are the most readily accessible for electrical stimulation, the authors decided to confine their work to this area.

In 32 experiments, peripheral circulatory stasis in the lower extremities was produced by the passive maintenance of a 70° angle from the horizontal by healthy adults placed on tiltboards. The subjects had previously been found sensitive to this procedure and trained for complete relaxation and immobility. Symptoms of shock occurred after from 10 to 50 minutes. The evidences of this state of gravity shock or orthostatic circulatory insufficiency are an increase of heart rate and diastolic pressure, a decrease of pulse pressure and systolic pressure, together with some pallor, sweating and distress.

Passive muscular contractions in the thigh and calf were induced by a sinusoidal current (surging interrupted direct current with alternating polarity) from a Burdick Morse Wave generator M-210 at an intensity and frequency comfortable to the individual subject. This was usually at from 20 to 30 milliamperes intensity and at a rate of from 18 to 20 contractions per minute.

It was found in these preliminary observations that this rhythmical electrical stimulation, applied to the muscles of the lower extremities of a subject in gravity shock, not only arrests the fall of pulse pressure and acceleration of heart rate, but rapidly restores them to normal. When the stimulation was introduced before the patient was subjected to the hydrostatic effects of gravity, the symptoms and signs of gravity shock were prevented completely.

Objection might, of course, be made that the reversal of the signs of gravity shock might be the result of emotional disturbances resulting from the mild discomfort of the electrical treatment. When, however, the type of current employed was one that produced similar discomfort without motor response, the course of gravity shock was unaffected.

This method is now being applied in the hospital at the Medical College of Virginia: (a) in the treatment of traumatic shock, and (b) as a preventive of postoperative shock, venous stasis, and thrombosis. To date, some 60 patients have been treated, and although the results so far are distinctly encouraging, it is considered that this number of patients is too small to warrant conclusions.

It is hoped, however, that the method will be tried and reported on in other hospitals. (Am. J. M. Sc., Oct. '48 - F. L. Apperly and M. K. Cary)

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Protective Action of Dibenamine After Hemorrhage and After Muscle Trauma: Wiggers and associates have demonstrated that in dogs suffering from shock produced by hemorrhage the survival rate was higher in those given the sympatholytic substance dibenamine (see study on dibenamine in News Letter of 7 May 1948) than in control animals. The inference made is that abolition of a severe vasoconstriction normally following hemorrhage protects the life of the animal.

In a series of dogs under morphine-nembutal anesthesia, 6 arterial hemorrhages of 5 c.c. per kilogram by weight each, were performed at 10-minute intervals. Aortic pressure pulse contours were recorded during the bleeding period, and for an additional hour. All wounds were then closed, and the animals put back in their cages. Cardiac outputs were calculated from the pressure pulse contours, and in a selected series by the dye injection method, and vasomotor resistance (Rv) calculated as the mean aortic pressure less 20 mm. Hg. divided by the flow per second. Specific gravity values of plasma and whole blood were determined at 10-minute intervals by the falling drop technic.

Because this experiment was done during the summer months, an expectedly sublethal hemorrhage proved fatal in 13 of 14 dogs, with an average survival of the 13 dogs for 4 hours. Ten more dogs were given, intravenously, from 10 to 20 mg. per kilogram of dibenamine in 50 c.c. saline one hour before the hemorrhage was begun. The completeness of the sympathetic block was demonstrated by the injection of epinephrine 5 minutes before the first bleeding. Nine of these animals survived. To rule out the possible effect of the salt solution itself, the last 5 of the control series received 50 c.c. saline one hour before the hemorrhage. All of these dogs died.

Systolic and diastolic pressure values for the two groups were not significantly different. The dibenamine-treated animals showed slightly higher blood flow values throughout, with faster pulse rates. Vasomotor resistance values, though showing roughly parallel changes in the two groups, were consistently lower in the treated dogs. There was no demonstrable correlation between the dilution of the blood and the survival period. In fact, as a group, the treated animals showed less dilution than the controls.

It has been shown previously that animals subjected to contusion of the muscles of both hind legs, by multiple blows with a light mallet, show higher resistance values than after hemorrhage, and die after a smaller loss of blood volume than would be required by hemorrhage. This higher resistance is presumably brought about by afferent nervous discharge from the traumatized

limbs. In this study 9 control animals, under morphine-nembutal anesthesia, were given 80 blows per kilogram by weight to each hind leg. All these dogs died, with an average survival of 3 and 1/2 hours. Nine more dogs were given dibenamine, as above, 1 hour before the trauma. Eight of these recovered, the ninth dog surviving 15 hours. As with the hemorrhage experiment, pressure values were not different in the two series. The pulse rates of the dibenamine-treated animals were greater, and flows were maintained at higher levels. These dogs, therefore, showed a lower vasomotor resistance.

A limited number of blood volumes, determined by T-1824 injection, indicated that the loss of blood volume in these animals was sufficient in itself to have caused death. The loss of blood volume was of similar magnitude in treated and untreated dogs. Peripheral resistance was definitely higher than after hemorrhage. The treated dogs did not show this rise in resistance, but rather a vasodilation. Death in the control series sometimes was preceded by the appearance of cardiac irregularity, which developed while the peripheral resistance was still high. Both groups showed a hemoconcentration. In the control series, however, this developed not during the trauma but after its completion. (Proc. Soc. Exper. Biol. and Med., Oct. '48 - J. W. Remington et al.)

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Preliminary Report on the Prevention of Gonorrhea With Penicillin Tablets: Studies on pneumococcal and streptococcal infections in mice and on syphilitic infection in rabbits have shown that the curative dosage of penicillin increases with the number of organisms in the infected animal, and with the age of the infection. These results suggested the possibility that in man penicillin tablets taken by mouth within a few hours after exposure might prove effective in the prevention of gonorrhea.

To test that possibility, a unit comprising approximately 350 naval personnel under fairly close medical supervision was divided into two equal groups. One group received 100,000 units of penicillin (increased to 250,000 units after the first 16 weeks), taken as a single oral tablet as the men returned to the ship from shore liberty, and whether or not they had been exposed. The second group received a similar-appearing tablet containing no penicillin.

Under the conditions of the study, and in the dosages used, oral penicillin was highly effective in the prevention of gonococcal infection. In the control group receiving no penicillin, there were 43 cases after 3,616 liberties, or 11.9 per thousand. In 3,218 liberties which were followed within a few hours after exposure by the ingestion of a single 100,000-unit tablet of crystalline penicillin G, there were 5 cases. In 1,238 liberties which were similarly followed by the ingestion of a single 250,000-unit tablet there was one case of gonorrhea. This developed 7 days after a "protected" liberty, the subject having, in the meantime, been absent without leave for 5 days, with frequent exposure.

The maximum length of time after exposure for which a single tablet of 250,000 units would be reasonably effective remains to be determined. In confirmation of the results in experimental infections, a study by Campbell and Curtis indicates that the efficacy of the prophylactic procedure falls off materially with increasing time elapsed since exposure. It may well be that if the penicillin were taken, e. g., from 12 to 18 hours after exposure, it might then be necessary to take two tablets at 6-hour intervals.

In the present study, there have been no complications to date which might militate against the general use of oral penicillin for the prevention of gonorrhea. The average frequency with which penicillin was taken during the first 16 weeks of the study varied from once monthly to as high as five times weekly, and the average intake in the entire group was 1.1 tablets weekly. There has been to date no evidence of sensitization to penicillin, no apparent development of penicillin-fast strains of gonococci, and no instance of suppressed syphilitic infection. Studies on the effect of the continued intake of penicillin on the bacterial flora of the mouth and intestine are now in progress. (Pub. Health Reps., 29 Oct. '48 - H. Eagle et al.)

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The Clinical Aspects of Chronic Thyroiditis: Chronic thyroiditis is not a rare disease, although any one surgeon may see few cases. The reason for reviewing the clinical aspects stems from the very low percentage of correct preoperative diagnoses made by the authors and co-workers, and from the fact that they, at times, failed to recognize the disease even when the thyroid was exposed at operation. The authors consider that chronic thyroiditis is not to be classed as a pathological curiosity, that it is important from the clinical standpoint, and that it is most important for the patient that the situation be fully recognized at operation.

The authors reviewed 34 case records of thyroiditis from the Surgical Service at the Roosevelt Hospital. Because they were only concerned with the obscure group of diseases called "nonspecific" chronic thyroiditis, they omitted from study 8 cases of acute thyroiditis (two with suppuration) and also two cases in which the lymphoid changes in the gland were marked but still focal. This left only 24 cases of nonspecific thyroiditis for detailed appraisal.

Many excellent reviews of this disease group are to be found, but nearly all deal largely with histopathology and etiology. Most cases fall readily into three subgroups:

(1) The struma lymphomatosa of Hashimoto (occurring about once in every hundred routine thyroid operations).

(2) The struma fibrosa, described by Riedel more than 50 years ago (somewhat less common than the first group).
(3) The giant cell type of DeQuervain (somewhat rare).

Much argument has been advanced to the effect that all these represent different phases of the same process, but the facts do not support this view and it seems to the authors that the division is clinically sound and useful.

In Hashimoto's disease the thyroid shows diffuse lymphocytic involvement with germinal centers, and widespread destruction of the thyroid cells. (Focal lymphoid accumulations are seen in many cases of Graves disease, and in other thyroid conditions, but careful study easily differentiates these glands from the Hashimoto group.) Hashimoto's disease is extremely rare in males, and occurs chiefly in women at or near the menopause. It seems to be a degenerative process, rather than an inflammatory one. Adhesion to surrounding structures does not occur. The thyroid is usually diffusely enlarged, and the patient has some discomfort and a sense of "fullness." Pressure symptoms are mild. There is apt to be early myxoedema, although it is likely that, in the very early stages, there may be a transient hyperthyroidism. The thyroid is firm but not hard, is grayish pink in color, and finely lobulated, but does not contain distinct nodules. Its cut surface is yellowish. Among 11 patients with the Hashimoto type of thyroiditis the usual history was that of slight discomfort, often intermittent, and usually more definite on one side than the other. In some the glands were quite large; in nearly all they were larger than normal; but in one case the size was within normal limits. The authors often felt sure before operation, that one or both lobes were nodular, but the findings at operation revealed true nodularity in only one case. The lobes often resembled very large lymph nodes. The blood supply was usually less than normal. In one case, in which there was a large diffuse struma lymphomatosa, lymphosarcoma followed partial resection after several months. Even in retrospect, the original sections were puzzling. This sequence is very rare, but has been reported by others.

After making a positive diagnosis, roentgen-ray therapy may be given, with good results. The authors' own practice has been to do a symmetrical conservative type of resection. Extensive resection is unnecessary and unwise. In any event, thyroid feeding will probably be needed.

Riedel's disease, or struma fibrosa, occurs in both sexes, but predominantly in women. It seems to be inflammatory in origin and the process spreads over the gland like a slow fire. The uninvolved portion of the thyroid is apt to be normal, and fairly normal thyroid function is thus preserved. The involved portion is pale and stony hard, presenting dense masses of fibrous tissue, and it is usually very adherent to the surrounding structures. This feature causes constriction. Freeing of the trachea, by tedious and careful excision of the isthmus, is often indicated; no more need be done, but because the condition is

often confused with cancer, unwise and harmful surgery may follow. In Riedel's original case he had a false impression of cancer. He attempted total extirpation, but soon abandoned the idea because of technical difficulties, and was amazed that the patient continued to live and prosper. One of the early patients in this present series did not fare so well, for the impression of cancer led to a total extirpation, with permanent loss of recurrent nerve and parathyroid function. If the frozen-section diagnosis is doubtful, permanent sections should be awaited before further surgical removal is undertaken.

The rarer type of thyroiditis, the giant-cell type of DeQuervain, also appears to be of inflammatory origin. The patient is likely to have real pain. Involvement of the thyroid is limited to certain areas and there is some tendency toward adherence to surrounding structures. The gland is not stony hard as in the Riedel type. The nature of the giant cells has been a matter of much dispute. The picture may closely simulate tuberculosis and has been called "pseudotuberculous thyroiditis." In the two cases of this sort in this series, the disease process was confined to the right lower portion of the thyroid gland. It caused considerable discomfort, with tracheal irritation. In one a neoplasm was diagnosed after examination of the frozen section. Only a conservative resection was done and the permanent sections indicated the proper classification. This patient has remained well for more than 13 years. Recent reports indicate that roentgen-ray therapy, following a positive diagnosis, may be the treatment of choice in this type.

Of the 24 case histories presented by the authors, there follow two:

Case 16. S. T., a 45-year-old white female, entered the hospital with the following complaints: lump in the anterior neck of one year's duration, fatigue and dyspnea of two years' duration, and dysphagia of one year's duration. Physical examination revealed a rather diffusely enlarged thyroid gland most pronounced on the right behind and below the clavicle. BMR was minus 27. A preoperative diagnosis of adenoma was made, and the treatment was right subtotal thyroidectomy. A postoperative diagnosis of Hashimoto's struma was made.

Case 22. C. M., a 38-year-old white female, entered the hospital with the chief complaint of a painful and marked swelling of the anterior neck of three weeks' duration. The patient was also nervous, had a tremor, and had allegedly lost 40 pounds. Physical examination revealed a firm, tender, enlarged thyroid gland. BMR was plus 38 on one occasion and plus 29 on another. A preoperative diagnosis of diffuse toxic goiter or possibly thyroiditis was made. Treatment consisted of removal of a wedge-shaped piece of each lobe plus bisection of the isthmus. A postoperative diagnosis of Riedel's struma was made.

Summary of the Clinical Aspects of 24 Cases of Chronic Nonspecific Thyroiditis. In 24 proven cases of chronic thyroiditis there were 11 cases of

Hashimoto's struma, 1 of which became lymphosarcoma, 11 cases of Riedel's struma, and 2 cases of pseudotuberculous thyroiditis of DeQuervain (giant cell type). The average age of the patients with Hashimoto's struma was 43.8 years, of the patients with Riedel's struma, 44.2 years, and of those with the DeQuervain type, 61 years. All these patients were white women. Enlargement of the gland was present in 10 of the 11 cases of Hashimoto's struma (91 percent), and in all cases of the Riedel's and DeQuervain types. Pain or tenderness in the thyroid gland occurred in 7 of the 11(64 percent) of the Riedel cases, in 5 of the 11 (45 percent) of the Hashimoto cases, and in 1 of the 2 (50 percent) of the DeQuervain cases. Pressure symptoms such as hoarseness, dysphagia, dyspnea, or choking occurred in 6 (55 percent) of the 11 Hashimoto cases, in 5 (45 percent) of the 11 Riedel cases, and in 1 (50 percent) of the 2 DeQuervain cases. The duration of symptoms in the Riedel group averaged 8 months, in the Hashimoto group, 5 months, and in the DeQuervain group, 6 months. The correct clinical diagnosis was made in 3 (28 percent) of the 11 of both the Hashimoto and Riedel groups and in neither case of the DeQuervain type. The diagnosis of cancer of the thyroid gland preoperatively or at operation before the pathological report was available occurred in 6 (55 percent) of the 11 cases of the Riedel group, 1 (9 percent) of the 11 cases of the Hashimoto group, and in 2 (100 percent) of the 2 cases of the DeQuervain group.

One factor in the amazingly low percentage of correct preoperative diagnoses in these conditions, in most hospitals, is that chronic thyroiditis is often not even mentioned as a possibility. A plea is made for the recognition of chronic thyroiditis before operation, and at operation. (Ann. Surg., Oct. '48 - H. Patterson and G. Starkey)

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The Heart in the Terminal State - Effect of Intracardiac Epinephrine: As a consequence of recent experiments on revival in animals, much interest has been aroused regarding the mode of death of the human heart, particularly in regard to its functional deterioration. In addition, a study of the dramatic effect of intracardiac therapy on the heart in the terminal stage in patients dying from various diseases has been considered by the authors as a field of paramount importance, particularly because they have had occasion to witness recently several instances of precipitous, unexpected, and unexplained death.

Objective studies of the effect of death on the heart must depend in great part on the use of electrocardiography, which, in addition to increasing profoundly knowledge of the heart in health and disease, has aided greatly in the investigation of the heart in its clinical and subsequent biologic death. The electrocardiogram has demonstrated repeatedly that clinical death, characterized by the disappearance of heart sounds and cessation of respiration, is followed in many cases for a variable and at times a prolonged period by cardiac activity. Certain measures designed to revive a dying myocardium

may some day make possible resumption of circulation adequate for continuation of life for a time. This possibility makes desirable an analysis of any knowledge which exists at present or which may be obtained in this investigation, concerning the sequence of events immediately preceding the total cessation of cardiac activity.

In this study electrocardiograms were taken in 34 cases before, at the time of, and after clinical death. Slowing of the cardiac rate was almost a constant finding with subsequent sino-auricular node depression and resultant auriculoventricular nodal rhythm appearing in over one third of the cases. Auriculoventricular and intraventricular block in various degrees were extremely common. Evidences of ventricular irritability were manifested by the frequent occurrences of ventricular fibrillation, tachycardia, and flutter along with ventricular extrasystoles from single and multiple foci. Auricular fibrillation did not appear terminally except in those instances in which it had been present previously. The terminal complex in the electrocardiogram represented ventricular activity in 27 cases and auricular activity in seven. The terminal ventricular complexes often assumed bizarre shapes with marked variation in form, amplitude, duration, and with considerable slurring.

Attempts at cardiac resuscitation with intracardiac epinephrine following cessation of heart activity were made in 18 cases, including 11 attempts in which the drug was injected into the cardiac chambers, and nine in which it was infiltrated into the ventricular myocardium. The latter method was more successful, producing an effect in five cases (56 percent), whereas the former accounted for only two responses (18 percent). The resultant rhythms included three instances of ventricular fibrillation, and two of ventricular extrasystoles; in only two patients was there restoration of regular ventricular beats, in one of whom the cardiac activity continued for 36 minutes after respiration had ceased.

The factors of age, sex, clinical findings, primary disease, precipitating cause of death, presence or absence of heart disease, or anemia, and findings at autopsy appeared to have no conditioning effect on the mechanism of death judging from the electrocardiographic manifestations. The findings in this series do not differ significantly from those reported by previous investigators. Although initial sinus acceleration often occurred, a conspicuous slowing of cardiac rate just before death was a most constant finding. Almost just as frequent was the occurrence of increasing auriculoventricular and intraventricular conduction times as death ensued. Ventricular fibrillation was the terminal rhythm in approximately 26 percent of cases.

From the physiologic point of view the initial sinus acceleration is due primarily to transient sympathetic nerve irritability. Very shortly before death the vagus centers in the medulla are apparently stimulated, producing in practically every heart, in the terminal state, a marked vagotonic state resulting

in sino-auricular node and auriculoventricular-conducting bundle depression. The fundamental factors of toxemia, asphyxia, and local nutritional changes in addition produce transient focal and local points of heightened irritability, particularly in the ventricular myocardium and only infrequently in the auricular wall.

Concerning the attempt at cardiac resuscitation, it appears not unlikely that if the patients in this series had not been so chronically and terminally ill, intracardiac epinephrine preferably given into the myocardium might have been more successful. Furthermore, unlike the procedure followed in this investigation, it would appear that the intracardiac epinephrine, to be life saving, should be given, if at all possible, before complete cardiac cessation when the heart muscle and vital cerebral centers have not been deprived of oxygen for too long a period. Resuscitation otherwise becomes quite impossible because of the fatal and irreversible changes due to anoxemia. (Ann. Int. Med., Nov. '48 - E. Massie et al.)

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Clinical Evaluation of Phenindamine (2-Methyl-9-Phenyl-2,3,4,9-Tetrahydro-1-Pyridindene Hydrogen Tartrate) as an Antihistaminic Agent: An antihistaminic substance may be defined as one capable of diminishing or preventing several of the pharmacological effects of histamine by competing with it for a particular site of action or for the same tissue receptor, rather than by the production of diametrically opposite pharmacological responses. This type of antagonism is reversible and one of the most specific in nature.

Despite its specificity, it has been repeatedly shown that the reaction does not necessarily involve closely related chemical analogues but may be produced by a diversity of compounds, which, though sharing an antihistaminic action in common, vary considerably in their pharmacological activity. For instance, certain of the benzhydryl alkamine ethers, to which class benadryl belongs, show, in addition to their antihistaminic activity, an atropine-like action, not shared by equally potent antihistaminic substances such as antergan, and closely related alpha-amino-pyridine derivatives of which pyribenzamine is one.

Although a number of compounds of the types just mentioned have exhibited a high degree of histamine-blocking action, many unpleasant side effects have occurred in their use. This has resulted in a widespread effort to find other substances, which retain the antihistaminic property, but lack in greater or lesser degree undesirable toxic side effects.

Phenindamine, which shows appreciable antihistaminic activity, is a compound of strikingly different chemical structure and pharmacological action

from the majority of antihistaminic compounds previously used in clinical medicine. In the latter regard, quite in contrast, for instance, to benadryl and pyribenzamine, it antagonizes the pressor responses to epinephrine, an action completely independent of its antihistaminic effects. In protecting guinea pigs from death due to exposure caused by inhalation of histamine spray, this drug proved to be about eight times as potent as antistine, twice as effective as benadryl and one half as active as pyribenzamine. In acute poisonings of small laboratory animals, it is from one third to one half as toxic as pyribenzamine and about equal in toxicity to benadryl.

The present observations, directed towards determining its scope of action and possible usefulness in human beings, were made in 133 normal persons, ranging in age from 18 to 61 years, and in 136 patients with allergic disease between the ages of 21 and 68 years. Under the term "normal," have been included not only people without recognizable disease, but also a limited number of subjects with chronic osteoarthritis, moderate arteriosclerosis, and those attending a general medical clinic for minor illnesses. Of the normal subjects, 100 were used to ascertain the frequency of untoward reactions to the drug. In the remaining 33, various bodily functions were observed. Intravenous glucose tolerance tests were carried out according to the method of Thorn, as adapted to the authors' facility.

Phenindamine was administered in tablets of 25 mg. in doses varying from 75 to 600 mg. daily for periods varying from 1 to 20 weeks. For specific tests, such as glucose tolerance and electrocardiographic tracings, unit doses of from 300 to 600 mg. were used.

Of the group in which studies of toxicity were carried out, 42 percent evidenced some untoward effect. The incidence varied directly as the size of the dose. With the average therapeutic dose of 150 mg. daily, the incidence of side reactions was 25 percent. When used in similarly selected and treated subjects, the corresponding incidence of reactions to benadryl and pyribenzamine was 64 percent and 64 percent, respectively. Phenindamine is thus about one half as toxic as benadryl and pyribenzamine.

The incidence of symptoms due to phenindamine in the descending order of their frequency was dryness of the mouth, insomnia, constipation, dizziness, jumpiness or jitteriness, burning of the conjunctivae, intestinal cramps, drowsiness, weakness, and palpitation. Five subjects refused to continue the drug because of the severity of the side effects, but in none of these was the dose less than 300 mg. at the time it was stopped. In the smaller doses, insomnia and gastro-intestinal symptoms were in the foreground. Most of the sensorial and circulatory symptoms occurred only when the largest doses were used.

Of the 136 patients who received phenindamine in a therapeutic range of dosage (from 75 to 250 mg. daily), 34 developed some unpleasant manifestation, and enumerated a total of 55 complaints attributable to these side reactions.

For the most part phenindamine lacks the sedative action of benadryl and does not share its weak atropine-like effect.

With phenindamine the over-all antihistaminic activity in the human being is from about one half to two thirds that of either pyribenzamine or benadryl. In the management of hay fever, it is approximately as effective as benadryl. In both vasomotor rhinitis and in asthma it is less useful than benadryl, although in selected cases in which the latter causes extreme drowsiness it proves of value. Satisfactory relief is obtained in a high percentage of the cases of chronic urticaria, although equal results have been reported with pyribenzamine and better results with benadryl. However, both the latter drugs have a greater tendency to undesirable side effects which may make phenindamine the drug of choice in many patients.

It seems likely from present comparative observations that no one antihistaminic substance will be useful in all cases in which such compounds are applicable, but that individual variations from patient to patient may justify a "trial and error" method of selecting the most suitable preparation for the case in question. (Am. J. M. Sc., Oct. '48 - T. H. McGavack et al.)

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Information Regarding Requests for Short Postgraduate Courses in Civilian Institutions: The Bureau of Medicine and Surgery has received numerous requests for authority to attend short postgraduate courses in civilian institutions at Government expense after the course has already commenced. Because the Bureau Advisory Board has to act upon all requests, and because certain arrangements have to be made for each enrollment with the civilian institution concerned, it is necessary that applications be received sufficiently in advance of the beginning date of the desired course to allow for completing these actions.

Whereas, in general, it is the Bureau's policy to bear the expense of enrollment in training courses, and whereas every consideration will be given requests received in time to complete the necessary arrangements, approval cannot be given to requests received after the course has commenced, and if the applicant is already in attendance, it will be at his own expense.

Applicants should submit their requests so that they will be received in the Bureau at least six weeks prior to the commencing date of any course, and include in their requests, the exact title of the course, exact dates of the course, cost of enrollment, and to what institution the fee is payable. (Professional Div., BuMed)

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Clinical Research in Naval Hospitals: See BuMed Circular Letter 48-133 on page 39.

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Course in Medical Aspects of Special Weapons and Radioactive Isotopes Available to Reserve Medical Officers: The Bureau of Medicine and Surgery announces the second in a series of courses of instruction in the medical aspects of special weapons and radioactive isotopes. This course is to be conducted at the U. S. Naval Medical School, National Naval Medical Center, Bethesda, Maryland. It will commence on Monday, 14 February, and end on Saturday, 19 February 1949.

This course is similar to the one presented at the Naval Medical School, National Naval Medical Center, Bethesda, Maryland, from 6 December through 10 December 1948. Inactive Reserve medical officers who desire to attend this course should submit a request for training duty to the commandant of their local naval district. All requests should reach the commandant's office prior to 17 January 1949.

The facilities available at the National Naval Medical Center make it necessary to restrict the attendance to 210 Reserve medical officers. The Bureau of Naval Personnel has established quotas as follows:

First Naval District.....24	Ninth Naval District.....50
Third Naval District.....32	Eleventh Naval District..... 2
Fourth Naval District 20	Twelfth Naval District..... 2
Fifth Naval District.....18	Thirteenth Naval District..... 2
Sixth Naval District.....20	Potomac River Naval Command.....12
Eighth Naval District.....18	Air Operational Training Command.....10

Sleeping quarters at the Center will be provided for many who wish such accommodations. Full messing facilities will be made available. (Personnel Div., BuMed)

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Examinations for Appointment in the Medical Corps of the U. S. Navy: Examinations for the selection of candidates for appointment to the grade of lieutenant (junior grade) in the Medical Corps of the Navy will be held at naval hospitals in the continental United States during the period from 24 to 28 January 1949.

Graduates of approved medical schools in the United States or Canada who have completed intern training in accredited hospitals or who will complete such training within four months of the date of the examination, who will be less than 32 years of age at the time of appointment, and who are physically and otherwise qualified, are eligible to take the examination.

Candidates will be required to appear before Boards of Medical Examiners and Supervisory Naval Examining Boards at the naval hospital nearest their place of residence to demonstrate their physical and professional qualifications for appointment.

Following approval by the President of the United States, selected candidates will receive their appointment and orders assigning them to duty in a naval medical facility for active naval service.

Public Law 365 - 80th Congress, approved 5 August 1947, provides additional compensation at the rate of $100.00 a month for each month of active service performed by officers of the Medical Corps of the Navy. This is in addition to any pay, allowances, or emoluments that Medical Corps officers are otherwise entitled to receive, and by the provisions of the law, the amount paid to any one officer under this authority is limited to a total of $36,000 computed on the basis of $1,200 yearly over a period of 30 years' active service.

Detailed information concerning the form and procedure of application may be obtained from Naval Officer Procurement offices or from the Bureau of Medicine and Surgery, Navy Department, Washington 25, D. C. (Professional Div., BuMed)

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The American Board of Oral Pathology Established: As the sponsoring agency, the American Academy of Oral Pathology announces the formation of the American Board of Oral Pathology. This board is incorporated in the District of Columbia and has been organized in accordance with the policies established by the Council on Dental Education of the American Dental Association. The members of the board are:

Lester Cahn, New York City..... President
Hamilton B. G. Robinson, Columbus, Ohio..... Vice President
Joseph L. Bernier, DC, USA, Washington, D.C... Secretary-Treasurer

The directors of this new board are those listed above as members plus the following:

Kurt H. Thoma, Boston, Massachusetts
Paul E. Boyle, Philadelphia, Pennsylvania
Donald A. Kerr, Ann Arbor, Michigan
Henry M. Goldman, Boston, Massachusetts

Detailed information concerning eligibility for certification and the character of the examination for such certification may be obtained by writing to the Secretary:

Lieutenant Colonel Joseph L. Bernier, D.C., U. S. Army
Army Institute of Pathology
Washington 25, D. C.

The board will conduct its first examination in the fall of 1949. Full particulars regarding this examination will be published at a later date. (Dental Div., BuMed)

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Dental Service, U. S. Naval Hospital, Great Lakes, Illinois, Approved: The Bureau of Medicine and Surgery has been informed that the Dental Service of the U. S. Naval Hospital, Great Lakes, Illinois, was approved by the Executive Committee of the Hospital Dental Service Committee of the American Dental Association on 11 November 1948.

Continuation of this approval is contingent upon maintenance of the Basic Standards for Hospital Dental Service as established or amended by the Hospital Dental Service Committee. (Dental Div., BuMed)

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Opportunity for Reserve Dental Officers for Full-Time Active Duty in the Naval Air Reserve Program: A billet for a dental officer, within the Naval Air Reserve Training Command, is available at each of the following stations:

NAS, Anacostia, D.C. NAS, Birmingham, Ala. NAS, Niagara Falls, N.Y.

Applications for this duty are desired from dental officers of the Naval Reserve not above the rank of lieutenant commander. Applications should be addressed to the Chief of Naval Personnel via the District Commandant, the Chief of Naval Air Reserve Training, and the Chief of the Bureau of Medicine and Surgery, listing the stations (in order of preference) at which duty is desired.

Applications should include a statement by the officer that he volunteers for one year or more of active duty in order to become eligible for the additional compensation of $100 per month authorized by Public Law 365, 80th Congress.

Under the present policy Reserve dental officers accepting these assignments will not be subject to change of duty station. (Dental Div., BuMed)

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BUMED CIRCULAR LETTER 48-128 JOINT LETTER 22 November 1948

To: MOinCs, NavHosps within Continental U.S.
Commanders, All Naval Training Centers.
COs, All MarCorps Activities, Continental U.S.

Subj: Authority to Take Final Action on Certain Reports of Medical Survey in Cases of Male Enlisted or Inducted Personnel

Refs: (a) MarCorps-BuMed Jt. Ltr MarCorps 1500-120, DGK-112-dmah, dtd 12 Sept. 1945. (BuMed C/L 45-225).
(b) BuPers-BuMed Jt. Ltr Pers-66-SRJ, P3-5; BuMed-3322-RAB-imb, P2-5, dtd 7 October 1946. (BuMed C/L 46-149).
(c) BuPers-BuMed Jt. Ltr Pers-66-JMS, P3-5; BuMed-3322, P3-5, dtd 11 February 1947. (BuMed C/L 47-13).
(d) BuMed Circ. Ltr. 45-43, dtd 21 February 1945.
(e) Para. 3318 Manual of the Medical Dept. (Rev. 1945).
(f) BuPers-BuMed Jt. Ltr Pers-65-ems, P19-1; BuMed-A18-1/P14-6, dtd 5 August 1948.
(g) BuMed dispatch 181445, dtd 2 August 1948.
(h) MarCorps L.O.I. No. 971 dtd 6 March 1945.
(i) Selective Service Act of 1948 - Public Law 759-80th Congress.
(j) Physical standards and physical profiling for enlistment and induction (A.R. 40-115).
(k) BuPers ltr Pers-651-AJD dtd 20 November 1942.

Encl: 1. (HW) Secretary of Defense Memorandum of 2 August 1948.

1. References (a), (b). (c), (d), (e), and (k) are cancelled. References (f), (g), and (h) (not to all and not needed) are modified insofar as they relate to Reports of Medical Survey.

2. In accordance with Section 4(b) of the Selective Service Act of 1948, the Secretary of Defense has prescribed physical and mental standards and procedures governing the discharge of persons inducted into the Armed Forces pursuant to the Act. These standards for discharge prescribed by the Secretary are forwarded herewith as Enclosure (1), and are effective upon receipt, applicable to all male personnel, that is, 18-year old 1-year enlistees (USNLV and USMC-V), inductees, enlisted USN and USMC, and reserves on active duty. Reference (j), Army Regulations No. 40-115, supersedes M.R. 1-9, referred to in Enclosure (1), and has been forwarded for information and guidance.

3. Reference (j) provides a system for indicating a person's physical and mental fitness, termed the Physical Profile Serial or PULHES Classification System, which is self-explanatory. When a question of incapacity for service arises the estimation of a man's functional fitness under this system will be a necessary step in deter-

mining whether he shall be retained in service or discharged. The person's physical profile serial shall be corrected whenever it appears that his physical or mental condition has changed to a degree necessitating reclassification.

4. The Secretary of Defense has directed that during the life of the Selective Service Act, no person, whether enlisted or inducted, will be discharged for medical reasons by any military department if his reclassified physical profile serial (see reference (j)) is at the minimum, or higher than the minimum, profile serial acceptable for induction, provided his services can be utilized effectively. (This includes all male enlisted personnel now in service and those enlisted or inducted in any branch of naval service while the Selective Service Act of 1948 is in effect.) It has been further directed that, in general, any man who has been enlisted or inducted shall be discharged from the U.S. Naval Service for disability (medical reasons) only:

(a) When in the judgment and opinion of competent medical personnel he has become functionally incapable of performing useful duty during the remainder of his service with due consideration given to whether his scaled-down physical profile serial is consistent with any assignment wherein he could perform useful work within the military department in which he is serving.

(b) Or when he has a medical condition of such nature that, in the opinion of competent medical personnel, to retain him for further active duty would aggravate such condition to the detriment of his future health and well-being.

(c) Or when his retention would, in the opinion of competent medical personnel, jeopardize the health and safety of his service associates.

5. In view of the foregoing, when reevaluation of a man's physical fitness for continuation in service becomes appropriate, his functional ability as measured by the physical profile serial (PULHES Classification) is to be determined. At the present time the minimum profile serial for induction is "3" in any column of the PULHES Chart (page 10 of reference (j)). In the event a man falls below the prescribed minimum induction standard or the special considerations set forth in paragraph 4 above become applicable in his case, he may be brought before a Board of Medical Survey with a view to recommending his discharge from service.

6. In view of the requirements of the Selective Service Act, all men functionally capable of performing duty are to be retained in service provided they can be assigned to useful duty. When their fitness for full duty is problematical, repeated trials of duty may be justified. When return to full duty is not feasible, return to limited duty may be recommended to the Navy Department by Report of Medical Survey. However, it is the intent of the Navy Department that, whenever possible, men be "returned to duty" rather than recommended for "return to limited duty." In general, the retention of personnel on limited duty will be authorized only if special circumstances apply, such as qualifications based on prolonged service

or specialty training, or disability incurred in combat or as a prisoner-of-war, or if the individual's services can be utilized and he is obviously fit for limited duty only.

7. (a) The addressees are hereby authorized to take final action on certain Reports of Medical Survey in the cases of enlisted or inducted men, subject to the restrictions listed in paragraph 8 of this letter, as follows:

(1) When the Board of Medical Survey recommends return to duty.
(2) When the Board of Medical Survey recommends retention for further treatment and it is probable that the individual can be returned to a duty status within a reasonable period of time.
(3) When the Board of Medical Survey recommends transfer of a psychotic patient to another naval hospital or to such other naval medical unit as may be currently designated for such cases. For the mechanics of transfer, refer to paragraph 3310 Manual of the Medical Department.
(4) When the Board of Medical Survey recommends discharge from service and the individual concerned is unfit for further service by reason of physical or mental disability.

(b) Medical Officers in Command, U.S. Naval Hospitals within Continental U.S. and Commanders, All Naval Training Centers are authorized to take final action locally, only in the cases of Navy personnel (USN, USMEV, USNR and inducted).

(c) Commanding Officers, All Marine Corps Activities, Continental U.S. are authorized to take final action locally, only in the cases of Marine Corps personnel, (USMC, USMC-V, USMCR and inducted).

8. All Reports of Medical Survey wherein the following provisions are applicable, shall be forwarded via BuMed to BuPers or MarCorps, as appropriate, for final action:

(a) Those involving personnel recommended for return to limited duty. It is emphasized that such recommendations are to be kept at an absolute minimum.
(b) Those involving personnel requiring further hospitalization who are recommended for transfer to a hospital other than a naval hospital except in accordance with paragraph 7(a)(3) of this letter.
(c) Those involving personnel requiring further hospitalization who are recommended for discharge from service and retention for continued treatment as supernumeraries.
(d) Those involving personnel who have completed 14 or more years of active naval service and whose discharge from service, transfer to the Fleet Reserve or transfer to the retired list (either from the active list or the inactive Fleet Reserve) is recommended.
(e) Those involving personnel recommended for discharge from service who present disability incurred in combat or incident to service as a prisoner-of-war and who desire to be retained in service. (In forwarding such reports information should be included as to the type of duty the individual is considered capable of performing and whether such assignment in active service would be likely to result in aggravation of disability. A signed statement of the man as to the action he desires, shall be forwarded with the Report of Medical Survey).

(f) Those involving an individual who has disciplinary action pending.
(g) Those involving an individual with disability considered by the Board to have been the result of his own misconduct.
(h) Those in which the individual submits a statement in rebuttal.
(i) Those in which discharge from service is recommended because the individual refuses surgical operation or other treatment for disability which is correctable and should be corrected under the provisions of existing regulations.
(j) Those in which the addressee having authority to take final action considers that the individual should be discharged by reason of unsuitability, inaptitude, unfitness or for other reasons rather than disability (medical survey).
(k) Those in which the addressee having authority to take final action considers it preferable to forward the report to the Navy Department for action.
(l) Those involving personnel recommended for discharge with one of the following diagnoses: (1) No disease, (2) Alcoholism, (3) Drug Addiction, (4) Pathological Sexuality or Sexual Perversion, (5) Operational Fatigue, (6) Motion Sickness, (7) Constitutional Psychopathic Inferiority, (8) Personality Disorder, (9) Schizoid Personality.

9. In the cases of Navy personnel (USN, USNEV, USNR and inducted), when final action is taken on Reports of Medical Survey in accordance with paragraph 7 of this letter, the original and one copy of the report shall be forwarded to BuMed, indicating by endorsement thereon, the action taken. If the individual concerned is transferred to a separation activity for discharge, one copy of the report shall be placed in his service record.

10. In the cases of Marine Corps personnel (USMC, USMC-V, USMCR and inducted), when the Medical Officer in Command of a naval hospital has approved a Report of Medical Survey and final action can be taken locally under the provisions of paragraph 7 above, he shall forward the original and four legible copies to the Commanding Officer of the Marine Corps activity concerned. Upon receipt of such approved reports and when the Commanding Officer of the Marine Corps activity takes final action, the original and one copy of the report shall be forwarded to BuMed and one copy returned to the Medical Officer in Command of the naval hospital from which received, showing, by endorsement thereon, the action taken.

11. (a) When the Medical Officer in Command of a naval hospital submits a Report of Medical Survey to BuPers or MarCorps via BuMed for final action, in the case of an enlisted or inducted man, he may whenever he considers that the individual does not require retention in the hospital, release him from the sick list and transfer him in a duty status to an appropriate duty station to await Navy Department action.

(b) U. S. Navy personnel released from the sick list under the above conditions, should be transferred from the hospital to the Receiving Station nearest their home of record if recommended for discharge, or the Receiving Station nearest the hospital if recommended for return to duty. U. S. Marine Corps personnel should be transferred to the Marine Corps Barracks nearest the hospital.

(c) In the above cases, the Medical Officer in Command shall indicate, by endorsement on the Report of Medical Survey, the temporary disposition effected. The Report shall be submitted to BuPers or MarCorps, as appropriate, via BuMed in original and four copies. If the man is transferred, one additional copy shall be forwarded to the station of transfer.

(d) At the discretion of the Commanding Officer of the Receiving Station or Marine Barracks and with the advice of the Medical Officer of the station in each individual case, these men may be assigned such specific duties as are compatible with and will not aggravate their physical condition, while awaiting action by BuPers or Commandant, Marine Corps, as appropriate.

12. No man who has completed ten or more years' active service, shall be discharged from the U. S. Navy or U. S. Marine Corps by reason of disability without first having been informed of his privilege of submitting an application for a naval pension under Revised Statutes 4756-57.

13. From time to time, as the needs of service demand, directives may be promulgated which temporarily will broaden or restrict the authority herein delegated for final action on certain classes of enlisted or inducted personnel.

--BuPers. T. L. Sprague --MarCorps. C. B. Gates

--BuMed. C. A. Swanson

Approved: John Nicholas Brown, Acting Secretary of the Navy

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BUMED CIRCULAR LETTER 48-129 22 November 1948

To: MOinCs, NavHosps within Continental U.S.
Commanders, All Naval Training Centers.
COs, All MarCorps Activities, Continental U. S.

Subj: Neuropsychiatric Officer Personnel; Transfer of

Refs: (a) Joint BuPers-BuMed-MarCorps Circular Letter, Pers-66-JMS P3-5, BUMED-3352-FGS-keh P3-5, MARCORPS-DGK-356-mla, dated 22 Nov 1948 (BuMed Circ. Ltr. No. 48-128).
(b) Par. 3310.1, ManMedDept.
(c) Par. 3318, ManMedDept.
(d) Par. 16B25, ManMedDept.

1. It will be noted that reference (a) cancels the present paragraph 3318 of the ManMedDept. Further, it will be noted that paragraph 3310.1 (promulgated by Advance Change 3-2, ManMedDept) makes reference to paragraph 3318.2(a) in defining the action to be taken in the transfer of neuropsychiatric officer personnel. Pending the promulgation of revised paragraphs 3310.1 and 3318, the following interim change should be made in the Manual of the Medical Department:

Paragraph 3310.1, 4th sentence: Delete the words "is outlined in paragraph 3318.2(a)".

2. The U. S. Naval Hospital, Houston, Texas, has been designated for the treatment of neuropsychiatric patients belonging to the Navy or Marine Corps. Modification of reference (d) is being made to reflect this change.

--BuMed. C. A. Swanson

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BUMED CIRCULAR LETTER 48-130 22 November 1948

To: MedOfCom, NavHosps within Continental U. S.

Subj: Marine Corps Personnel Brought Before Boards of Medical Survey; Disposition in Cases with Disciplinary Action Pending

Refs: (a) BuMed Circ. Ltr. No. 44-3 of 5 Jan 1944.
(b) Joint BuPers-BuMed-MarCorps Circular Letter, Pers-66-JMS P3-5, BUMED-3352-FGS-keh P3-5, MARCORPS-DGK-356-mla dtd 22 Nov 1948 (BuMed Circ. Ltr. No. 48-128).

1. Reference (a) is hereby canceled in view of the provisions of reference (b).

--BuMed. C. A. Swanson

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BUMED CIRCULAR LETTER 48-131 23 November 1948

To: All Medical Department Activities

Subj: Dental Standards

1. The following is quoted from AlNav #242 dated 13 November 1947:

"Effective immediately physical standards for enlistment and reenlistment in the regular Navy and Class V-6 Naval Reserve are modified as follows. (a) Dental requirements: Applicants must be well nourished and have good

musculature, be free from gross dental infections and have a minimum requirement of an edentulous upper jaw and/or an edentulous lower jaw corrected or correctible by a full denture or dentures."

This AlNav only modified the dental standards for enlistment and reenlistment of men in the regular Navy and Class V-6 Naval Reserve. It did not modify the dental standards for qualification for appointment as commissioned and warrant officer USN and USNR, which remain as stated in paragraphs 2150 and 2151 Manual of the Medical Department, U. S. Navy. Paragraph 2118, Manual of the Medical Department should be used as a guide in applying dental standards when examining members of the Naval Reserve and the Marine Corps Reserve.

2. The following is quoted from AlMar #47 dated 30 July 1948:

"Refer Para 9 'Physical standards for enlistments and reenlistments' of LTRINST 1594. Delete phrase 'as modified by AlNav-242-47,'."

This AlMar reestablishes the dental standards for enlistments and reenlistments in the Marine Corps as they are stated in paragraph 2150 Manual of the Medical Department, U. S. Navy.

3. The dental standards for enlistment or reenlistment of men in the Navy and Marine Corps are therefore not alike.

4. The dental standards for enlistment or reenlistment of women in the Navy and Marine Corps are as specified in paragraph 2150, Manual of the Medical Department, U. S. Navy, and paragraph 3(c) BuPers C.L. No. 116-48 published in 30 June 1948 Navy Department Bulletin.

5. The dental standards to qualify for appointment as Midshipman U.S.N. for the U. S. Naval Academy, Midshipman and Contract Student U. S. Naval Reserve Officers Training Corps, Midshipman Merchant Marine Academy and other officer training programs are as specified in paragraph 2152 Manual of the Medical Department, U. S. Navy.

--BuMed. C. A. Swanson

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BUMED CIRCULAR LETTER 48-132 29 November 1948

To: All Ships and Stations

Subj: Wilmot Castle Overhead Operating Light; Installation Check of

Ref: (a) BuMed C/L 48-109; N.D. Bul. of 15 Oct 1948, 48-776.

Encl: 1. (HW) Installation Check Sheet, Castle No. 12 Light.

It is stated in this letter that instances have been reported of the falling from place of the Wilmot Castle No. 12, overhead operating light because a screw nut or set screw became unscrewed or sheared off. The manufacturer's suggestions for checking the lamp installation are contained in the enclosure. All such failures should be reported as per reference (a).

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BUMED CIRCULAR LETTER 48-133 29 November 1948

To: DMOs; DDOs; and MedOfsCom, NavHosps

Subj: Clinical Research in Naval Hospitals

Ref: (a) BuMed CircLtr No. 48-46.

Encl: 1. (HW) NavMed 138 (Rev.).

1. Reference (a) stresses the importance of medical research in the Navy.

2. Clinical material available in Naval Hospitals provides an excellent source for research in medicine, surgery, dentistry, and the ancillary specialties.

3. In order to ensure organization and continuity of research effort in Naval Hospitals, an officer designated by the Medical Officer in Command shall be assigned collateral duty as Chief of Research. It shall be his duty to organize, stimulate and supervise clinical investigation pertaining to any or all of the professional services, and to encourage medical department officers, including residents and interns, in learning and applying the techniques and philosophy of clinical research.

4. Good liaison between the major services and the ancillary specialties will be required in order to develop an effective program. It is therefore suggested that Chiefs of Service and civilian consultants be employed in an advisory capacity to the Chief of Research.

5. Cooperation and minor assistance will be furnished informally by Naval Medical Research Establishments if requested. Formal application for more extensive consultation, including statistical assistance, should be addressed to the Bureau.

6. Research proposals should be submitted on NavMed 138 (revised), samples enclosed, to the Chief of the Bureau of Medicine and Surgery for consideration. Such proposals, if approved, will be formally established as projects, the proposing agency will be so advised, and necessary funds will be allocated in support.

--BuMed. C. A. Swanson

BUMED CIRCULAR LETTER 48-134 29 November 1948

To: Ships and Stations (Selected List)

Subj: Radiological Safety Regulations; Changes to

Ref: (a) BuMed Circular Letter No. 48-10

This letter contains changes which are to be made in reference (a) effective immediately.

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BUMED CIRCULAR LETTER 48-135 1 December 1948

To: Medical Officer in Command, U. S. Naval Hospitals; U. S. National Naval Medical Center, Bethesda; and U. S. Naval Medical Center, Guam

Subj: Collection and Reporting Payment of Utilities of Commissioned Officers' Messes (Open) Ashore

Ref: (a) BuPers Cir Ltr No. 135-48, N.D. Bulletin 48-554, 31 July 1948

This letter (1) directs the attention of addressees to reference (a), (2) informs addressees that they are to collect on an actual or estimated basis, charges for utility services furnished and consumed in connection with any social entertainment or recreational activities of such messes, (3) indicates how collections will be reflected in quarterly reports, and (4) states that the current accounting instructions will be amended in accordance with reference (a) and the change issued in the near future.

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BUMED CIRCULAR LETTER 48-136 1 December 1948

To: Distribution List

Subj: Naval Medical Supply Depot, Pearl Harbor, T.H.; Mission of

Ref: (a) CNO ltr Op-40E-1er, FF(23)/A3-1, Serial 933P40, dated 19 November 1948.
(b) BuMed Circular Letter No. 48-23 dated 26 February 1948.

1. In accordance with the authority contained in reference (a), paragraph 1(a) of reference (b) is changed to read as follows:

"To procure, store, prepare for shipment and deliver to transshipment agencies standard medical supplies and equipment for all U. S. Naval and Marine Corps activities and forces of or calling at the 14th naval district, including Midway and Palmyra Islands. (This shall in no way be interpreted as altering directives relative to regularly established medical supply requisitioning channels.)"

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BUMED CIRCULAR LETTER 48-137 2 December 1948

To: MedOfCom, U. S. Naval Hospitals; U. S. Naval Medical Supply Depots; National Naval Medical Center, Bethesda, Md.; Naval Medical Center, Guam, M. I.

Subj: Periodic Pay Increases of Civilian Employees

Refs: (a) BuMed CircLtr No. 47-52 of 24 Apr 1947.
(b) BuMed CircLtr No. 47-74 of 16 Jun 1947.
(c) BuMed CircLtr No. 47-81 of 25 Jun 1947.
(d) NCPI 195.

1. Reference (a), (b), and (c) are hereby canceled.

2. The most recent revision of reference (d) extends eligibility for periodic pay increases to temporary indefinite and emergency indefinite employees on or after 1 July 1948. Further, employees in positions of master, foreman, chief training supervisor, senior training supervisor, training supervisor, and apprentice supervisor are eligible for periodic pay increases; such increases are to be effected in accordance with NCPI 195.9.

--BuMed. H. L. Pugh

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BUMED CIRCULAR LETTER 48-138 3 December 1948

To: All Medical Department Activities where Nurses are Assigned

Subj: Change in Uniform of Navy Nurses

This letter informs addressees of the basis upon which the changes in the uniform for nurses was made and states that although the new uniform has been approved and designated as the uniform for the women of the Navy, the present uniform may be worn until July of 1952.

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BUMED CIRCULAR LETTER 48-139 6 December 1948

To: All Ships

Subj: Caskets and Embalming Sets; Requirements for

Ref: (a) Navy Regulations, 1920, Art. 908(3) and 1841(6).
(b) Manual of the Medical Department, 1945, Paras. 3420, 3422, and 3423.

This letter, scheduled to be published in the Navy Department Bulletin of 15 December 1948, states that in time of peace, it is essential, insofar as possible, that ships of the active fleet be in a position to comply with references (a) and (b) and contains information and instructions relevant thereto.

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BUMED CIRCULAR LETTER 48-140 6 December 1948

To: All Stations

Subj: Plant Account - Information on Coding from Item Descriptions

Refs: (a) SecNav ltr: M625/ERC:hkc over Serial 138, dated 10 May 1946.
(b) Facilities Inventory Handbook (Navexos P-406) dated November 1946.
(c) BuMed Circular Letter 46-166, 15 Nov 1946, BuMed-42 EN3/L11-2.

This letter, scheduled to be printed in the 15 December Navy Department Bulletin, states that in order to exercise inventory control effectively, the tens of thousands of different items used and stocked by the Armed Services must be uniformly classified according to their functions and/or physical characteristics into a relatively few categories to simplify record-keeping and administrative control. In addition to a classification system, it is important that each category and subdivision thereof be coded for easy reference.

Reference (b), promulgated by the Secretary of the Navy, stated that the Navy's equipment (Plant Account Property Class 3) would be classified in accordance with the Standard Commodity Classification, and made the application of this classification system a responsibility of the various bureaus. Inasmuch as the Bureau of the Budget, which developed the Standard Commodity Classification, did not carry it beyond the level represented by four digits of the code, the several bureaus were requested by the Office of Naval Material to participate in the development of a more detailed classification, and an expansion of the numerical code to cover the more detailed breakdown.

Accordingly, BuMed undertook the development of a classification and code number for equipment carried in the Army-Navy Catalog of Medical Material and other Non-Standard Medical and Surgical Equipment on hand in field activities. Results of this effort were incorporated with the results of the other bureaus into a coding manual for use by the Bureau of Supplies and Accounts which was assigned the task of abstracting to punch cards pertinent statistical information from the property record cards submitted by all field activities.

A description of the classification and its application are given.

By reference (a), the Secretary of the Navy directed that a physical inventory be initiated as of 1 January 1947 to include all facilities (lands, buildings and improvements, and equipment) located at all naval medical activities under the management control of the Bureau of Medicine and Surgery. Reference (c) published by the Chief, Bureau of Medicine and Surgery, to All Naval Stations and Marine Corps Activities, gave specific instructions pertaining to the inventory and reporting. Accordingly, this letter directs that all persons responsible for the inventory and reporting of Medical Department plant account items make every effort to insure complete and accurate records of the plant account.

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BUMED CIRCULAR LETTER 48-141 6 December 1948

To: All Naval Hospitals, Hospital Ships and Medical Supply Depots

Subj: Streptomycin: Procurement and Use of

Refs: (a) BuMed News Letter, Vol. 8, No. 12 (6 Dec 1946).
(b) BuMed-4221-JTE:mas, Serial 52640, dtd 25 May 1948 - P3-2(17).

1. Reference (a) outlined the procurement and use of streptomycin and, by reason of the limited availability of this drug, directed requisitioning on a case basis only for those diseases in Group I, with approval of requests for diseases in Group II dependent upon the stock status of streptomycin. Reference (b) approved the establishment of limited stocks of streptomycin, 50 grams, in each naval hospital.

2. In view of recent studies whereby the therapeutic value of streptomycin in certain diseases has been fairly well established, and the fact that production of this drug has risen to the point that it is more readily available, references (a) and (b) are hereby modified as follows:

(a) Without prior reference to the Bureau, hospitals and hospital ships may requisition their requirements for streptomycin for the treatment of

diseases outlined in Groups I and II of reference (a), direct from the nearest naval medical supply activity.

(b) Hospitals and hospital ships are now permitted to maintain a maximum stock on hand of streptomycin equivalent to three (3) months, based on issue rate for preceding twelve (12) months.

(c) The procurement and use of streptomycin for the diseases outlined above is authorized for the care and treatment of dependents entitled to such by law.

3. The procurement and use of streptomycin for diseases and conditions other than above requires prior Bureau approval.

--BuMed. C. A. Swanson

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